

Marcy (H. O.)

all

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## Surgical Relief for Biliary Obstruction.

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BY  
HENRY O. MARCY, A.M., M.D., LL.D.,  
OF BOSTON.  
SURGEON TO THE HOSPITAL FOR WOMEN, CAMBRIDGE, ETC.

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*Read in the Section of Surgery and Anatomy, at the Forty-first  
Annual Meeting of the American Medical Association, at  
Nashville, Tenn., May, 1890.*

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Reprinted from the "Journal of the American Medical  
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## SURGICAL RELIEF FOR BILIARY OBSTRUCTION.

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The surgery of the gall-bladder opens another and an extremely important field for operative interference. Biliary obstruction has been, from the earliest times, recognized as a cause of most severe suffering attended with the gravest dangers.

With very few exceptions, operations for its relief have been considered beyond the *pale* of surgical domain, until within a few years, and even now, although abdominal surgery is almost universally accepted as justifiable, in a multitude of varying conditions, only a very few surgeons have attempted operation upon the gall-bladder.

My own experience is limited to the following cases which, inasmuch as they illustrate a variety of conditions, are of sufficient importance to put upon record.

*Case I.*—Dr. W——, aged 72, a physician of exceptional intelligence, had clearly diagnosticated repeated attacks of suffering, extending over a number of years, as due to biliary obstruction, a gall-stone. Although somewhat jaundiced, the more prominent and dangerous symptoms were caused by the continuous vomiting. The attack preceding the operation, which was performed July, 1887, was more severe than any previous one, causing imminent danger to life. Pulse rapid, temperature slightly above the normal, no food retained upon the stomach, rectal alimenta-

tion maintained for several days, emaciation pronounced. There was pain and tenderness just to the right of the median line, and upon pressure an ill-defined enlargement was felt.

Upon section, the base of the liver was easily found, and a rather small, undistended gall-bladder, intimately bound to the transverse colon by old and firm adhesions. The finger, carried in the direction of the common duct, easily detected a gall-stone of considerable size, which was dislodged and retracted into the lower portion of the gall-bladder. A prolonged attempt at separation of the adhesions was made, with considerable loss of blood from the divided tissues, which were exceptionally vascular. After consultation with Dr. Worcester, who ably assisted me in the operation, it was reluctantly determined unwise to proceed farther, and the wound was closed. Marked relief followed for a few days; the exploratory wound healed by first intention. The old symptoms, however, soon supervened, followed by death. A careful autopsy was made by Prof. Frost, of Hanover, who reported that a calculus, about the size of a walnut, was in the greatly dilated common duct, producing complete occlusion. Although the hepatic structure was not materially changed, yet the old adhesions, binding the gall-bladder to the transverse colon, were so extensive, that the post-mortem dissection was made with difficulty and, on this account, further operative measures would have been, in his judgment, unjustifiable.

*Case 2.*—Mrs. R——, in middle life, extremely fleshy, a patient of Dr. Cunningham of Cambridge. When seen by me in consultation, persistent vomiting had continued for several days, ushered in by extreme pain in the right hypogastrium. She was slightly jaundiced, pulse small



and rapid, condition considered one of extreme danger; referable to biliary obstruction. She had had several previous attacks less severe. On section, extensive adhesions were found, binding a moderately distended gall bladder to the surrounding parts completely overlaid, as in the previous case, by the transverse colon. With some difficulty I dislodged and retracted a biliary calculus from the common duct, but deemed it unwise to attempt its removal, because of the impossibility of freeing the gall-bladder and bringing it within the lips of the wound. Rapid recovery followed with primary union, a free flow of bile into the intestine ensued, and the patient now, at the expiration of about two years, continues well.

*Case 3.*—Mr. J——, formerly a sailor, aged about 45, had been under my care for some months, suffering from supposed cancer of the pylorus. He developed rather rapidly a fluctuating tumor in the region of the gall-bladder, of fist-size. Was considerably emaciated and markedly ænemic. This condition made the former diagnosis doubtful, and operative measures were advised and gladly accepted. Entered hospital October, 1887, and assisted by Drs. Holt and Nelson I made an exploratory incision. Immediately upon opening the abdomen, the cystic tumor pressed into the lips of the wound. The tumor was carefully attached to the peritoneum by a double row of continuous tendon sutures and then opened. About six ounces of a whitish, mucopurulent fluid escaped, without a seeming trace of bile. Exploration detected no trace of biliary calculi; the finger carried deeply was brought in apposition to a thickened mass in the region of the outlet of the stomach. A large double drainage-tube was inserted, about which the lips of the wound were closed. It was washed out for

some days with a weak solution of sublimate; the secretion amounted to several ounces daily. Contraction slowly followed, leaving a sinus which closed only after several weeks. Marked improvement followed for a time, but death occurred some months later, and the autopsy revealed primary cancer of the stomach, with a secondary deposit studding the liver.

The cystic duct had been closed from the secondary changes which had ensued; the interesting specimen is here shown.

*Case 4.*—Mr. M—, aged 45, of regular habits, a healthy, hard-working man until eighteen months previous to operation, April 29, 1889. Had developed rather rapidly a well marked jaundice, with frequently returning intermittent attacks of excruciating pain followed by vomiting. Had been supposed by his physicians dying of cancer of the liver. Skin dark copper tint, emaciation not extreme. Stools light gray, urine dark brandy color. Diagnosis, occlusion of the common duct, possibly gall-stone. I was assisted in the operation by Drs. Didama and Jacobson of Syracuse, N. Y., and Dr. Nelson of Boston. Present Drs. Warner, Cunningham, and others. Liver was enlarged and very darkly colored. Gall-bladder distended, extensive adhesions to the surrounding parts. United it to the lips of the wound as in previous case and incised. Careful probing detected no evidence of stone, and it was determined that the cystic duct was occluded from an inflammatory process. Put in drainage-tube and closed the wound about it without much expectation of benefit. A free discharge followed with continued and rapid improvement. Jaundice lessened and when seen in September had entirely disappeared. The wound closed, appetite good, strength, in large measure,



returned and he does light work. He continued to gain strength until March of the present year when jaundice returned with a repetition, in a minor degree, of former sufferings.

*Case 5.*—Mrs. P——, aged 40, has had several attacks of biliary colic of a serious character, accompanied with jaundice. The last attack preceding the operation occurred in August, 1889. Life at that time thought to have been imperilled, she has not been quite well since. Entered my private hospital. Has severe local pains, some vomiting, markedly jaundiced; dark urine; clay-colored stools. Thick abdominal wall, beneath which a considerable sized fluctuating tumor is well defined, the base of which is quite on the line with the umbilicus. Operation October 26, 1889, assisted by Drs. Clark and Nelson.

Immediately upon dividing the peritoneum, the cystic growth distended the lips of the wound. It was attached to the peritoneum by a double row of tendon sutures and incised. Ten ounces of thin, light colored bile escaped, floating out with it a gall-stone, the size of a large almond. Careful probing revealed the presence of another calculus in the common duct. All effort at dislodgment failed, and as much force as was deemed justifiable was used in the attempt to crush it, but without avail. The bladder was washed out with a sublimate solution, the stitches cut away, the wound packed with a sponge after having somewhat forcibly drawn the gall-bladder through it. Even this procedure did not enable us to seize and remove the calculus. I then divided the walls of the duct with scissors, and everted its edges from over the roughened calculus which was even then removed with difficulty. The thickened mucous membrane of the duct and bladder was joined by a fine continuous tendon

suture, and in like manner the peritoneal edges were carefully coapted, while over all a third layer of suturing with tendon, a continuous sero-serous stitch intrafolded the edges of the entire wound of the viscus measuring about four inches. The abdominal wound was closed by buried animal sutures, in the usual manner, and sealed with iodoform collodion. Free vomiting of a large amount of bile followed the recovery from ether. Rapid convalescence ensued without incident, and the patient remains vigorous and active. This rough mulberry-looking calculus, grape-size, was the offending member, weighing when dried fifty-nine grains.

A brief review of the history of the surgical measures devised for the relief of biliary obstruction is of great interest and value. Thudicum reports that Johannes Fabricius removed gall-stones from the bladder of a living subject in 1618.

Monsieur Petit of Paris first published his admirable memoir, on the diseases of the gall-bladder in 1743. I review, at considerable length, his article, found in the *Memoires of the Royal Academy of Surgery*,<sup>1</sup> since nothing more valuable, even to the present, has been published upon this interesting subject. In the first part of his contribution, he analyzes with remarkable clearness the differentiation of the varying conditions of the obstructive diseases of the biliary passages. He cites a long series of interesting cases occurring under his own observation, supplemented by a report of autopsies. He clearly defines clinical distinctions between abscess of the liver and the distention of the gall-bladder as follows. "Fluctuation in consequence of retained bile appears suddenly, in an abscess it is some

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<sup>1</sup> Tom Premier, 1781, Page 265, 56, etc.

length of time before it is apparent; in the one *it is suspected before it is recognized*; in the other recognized before suspected. In the one there may be doubt as to the point of fluctuation, while in the other it is known at once by the touch." He points out very clearly the dangers from operative measures which he thinks would be necessarily fatal if the contents of the gall-bladder should escape into the peritoneum, and as a consequence restricts all operative measures to the class of cases where inflammatory changes have caused adhesion of the cyst to the peritoneum.

He analyzes these changes with the closest scrutiny in order to make definite, as far as possible, such conditions before operation and then states, "What I have observed should moderate the ardor of young men who desire always to cut, but should therefore an unwise timidity cause them to let pass the occasion of operation in cases where they are persuaded the tumor is caused by dilation of the gall-bladder, occasioned by retention of the bile? If the observations on the first two cases show that a few of these tumors cannot be opened except at the risk of the life of the patient, those on the third case show that there are those cases which may be opened without danger." . . . . "If convinced that the tumor is adherent, that the life of the patient is in peril, we should not hesitate to open the bladder, for we should not wait for nature to perform miracles. It is true she does commence, since she causes the adhesion, and opening the gall-bladder without adhesion is always fatal, but it is the duty of the skilful surgeon to observe nature and to profit thereby, to seize upon the favorable moment to act himself, when he sees that nature needs his aid, and that she cannot complete what she has commenced without it. If we can be es-



sured of the adhesion, then we may open without danger the tumors which are found in these parts, and then shall we add two new operations to surgery, one, in cases where the retention of the bile is extensive and danger to life imminent, the other, lithotomy, or extraction of stones from the gall-bladder. The existence of the stone and adhesion being assured, the operation is without danger. It is in just these cases that the skillful surgeon can show his genius. We can pass the sound into the urinary bladder for determining stones in it, why not pass the sound into the gall-bladder for the same purpose, and if stones are found, why not extract them as from the urinary bladder? If we can without rashness open the gall bladder when it is adherent, we can pass the sound without rashness, and if stones are found there, what reproach should be to him who does not dare to extract them, and what praise should be given to the surgeon who would remove them?"

Petit then gives a series of interesting illustrative cases in detail, one of which is that of a woman, 37 years old, previously vigorous, where a tumor of the gall-bladder supervened after an attack of biliary colic. This increased in size, until it extended even to the crest of the ileum, suppuration and discharge followed, with the escape of seven or eight gall-stones. Six months after, the patient came under Monsieur de la Pegroneé. At this time the discharge was abundant, of purulent character, mingled with bile. After careful probing of the fistula, he made an incision about three inches in length, extending to the middle of the right rectus muscle, which was followed by the escape of a considerable quantity of pure bile. Without difficulty a sound was carried into the gall-bladder to the depth of

about four inches which he believed entered the common duct, in which location he thought a small stone was lodged and displaced. He reports the case two years later, the fistulous tract remaining through which is a free escape of healthy bile, and the patient appears to have entirely recovered her former health.

*Case 11.*—Observed by Monsieur Sarran. A woman, aged 64, had colic, followed by complete jaundice. A tumor appeared in the right hypochondrium which finally opened spontaneously, leaving a fistula, which, from time to time, discharged. At the time of operation the fistulous opening was at the side and a little below the umbilicus. The sound entered the fistula to some distance, beneath the muscles of the abdomen, where was felt a hard foreign body.

An incision was made upon it, and a biliary calculus four inches long by three in circumference was withdrawn. Upon the opposite side, at the left of the linea alba, was felt another mass at the depth of an inch and a half, from which was extracted a second stone by the prolongation of the first incision. Complete cure followed in about two months.

*Case 12.*—Reported by Monsieur Habert, Docteur de Sarbonne. A woman, having been jaundiced for a long time, with a very considerable tumor in the right hypochondrium, after a severe attack of colic accompanied with convulsions, passed by the bowel a gall-stone, weighing three and a half drachms, two inches and a half in length, one and a half in diameter, three and a half in circumference, polished at its ends in facets. The tumor diminished in size, and health was slowly reëstablished.

Petit's work was discussed by some of the leading surgeons of his time, with little resulting

profit to sufferers, and in large measure was forgotten, even Richter, who published a half a century later, making no reference to it, in his monograph upon the subject. The latter made original studies upon jaundice and the causal conditions. He determined that the general pigmentation of the tissues might occur without obstruction to the free flow of bile from the gall-bladder, and also that the outflow might be entirely prevented and the jaundice-state not supervene. The more common cause, he believed, lay in a perverted action of the liver, dependent upon a derangement of the hepatic circulation. He gives, however, in symptomatic detail a case of obstruction in the common duct from a calculus which went on under his care to death, and figures the specimen, without the hint of a possible relief from surgery. As an interesting illustrative case I quote the report of the autopsy.<sup>2</sup>

"Mr. S., gouty diathesis, age 40. Troubled with jaundice four years. In hospital two weeks. The gall-bladder was five inches long and two broad, quite full of dark bile and contained thirty gall-stones. The ductus choledochus and the parts about were preternaturally distended. On cutting into the substance of the liver a very great quantity of dark brown bile issued as from a sponge, of the same nature with that which was found in the gall-bladder. There was a stone in the ductus choledochus which, on account of its uncommon size, I have caused to be engraved on the annexed plate. It weighed three ounces and five drachms. All around the stone there was fluid bile, so that this fluid had evidently passed by the stone into the duodenum. It fell

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<sup>2</sup> Aug. Gottlieb Richter, M.D., Prof. Med. University, Goettingen, 1793.



into three pieces on being taken out. The external surface resembled a very firm extract of liquorice. On some places there are evident marks of smaller stones adhering to it. The thick end of the stone was in the duodenum, the most pointed was turned towards the neck of the gall-bladder." He gives another case of interest as follows: "A woman died in the hospital in the highest degree of jaundice. On inspecting her body, no gall-bladder was found, but in its place only a skinny substance of a very small size, in which no cavity could be discovered. The whole liver was full of white concretions, apparently of the nature of calcarious earth, of different sizes, from that of a cherry to that of a pea, which floated on water. . . . Most of the concretions lay under the external membrane, some few in the substance of the liver. These probably contained the irritating matter which occasioned the jaundice."

He concludes by stating, "that real obstructions are very seldom the cause of jaundice; where they do occur, they occasion an incurable disease, for this cause neither can be discovered, or removed." . . . "If stones are sometimes the cause of the jaundice, they act probably by occasioning irritation and spasm, which stops the biliary ducts, or deranges the course of the fluids in the hepatic system, and in such cases no other medicines but sedatives are of any use."

In 1798, Richter devised a litho-triptor for crushing gall-stones, and explained how the fragments could be removed by washing. In certain cases he also advocated operative measures, by first bringing about adhesive inflammation of the gall-bladder to the abdominal wall, and making an incision, as a second operation, after sufficient time had elapsed for securing a firm union.

Morgagni<sup>3</sup> mentions a case where the common duct was as large as the stomach and contained calculi of different sizes.

Dufresne, in 1847, recommended the use of caustic over the dilated gall bladder in order to cause adhesive inflammation before opening. About that date, Recamier advised the use of the trocar. Thudicum, in 1859, reviewed the entire subject carefully. He recommended abdominal section over the cyst, and the suturing of the unopened gall-bladder to the peritoneum, and after sufficient time had elapsed for a firm union, completion of the section.

Trousseau furnishes an interesting chapter upon the subject, with the report of cases, advising surgical procedure after the manner of Petit, but he emphasizes the observations of Boyer who declared that there was but two signs which indicated the adhesion of the cyst, immobility of the tumor and puffiness of the integuments. In order to insure adhesion, Trousseau advised the insertion of thirty to forty steel needles with large heads which were allowed to remain three or four days. This process is repeated three times before peritoneal adhesion is supposed to be firm. He states that internal biliary fistulæ are quite beyond our means of treatment. He dismisses the subject with the acknowledgement that little good is to be expected from treatment except opiates and sedatives.

Frerichs, in his classical treatise upon diseases of the liver, offers little of value as to treatment of biliary obstruction and states, "We must never think of evacuating the contents of the gall-bladder by means of puncture, except when the rapid increase of the tumor endangers rupture, or where symptoms of hectic consumption super-

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<sup>3</sup> Morgagni—Letter 37.

vene." When there are adhesions, the operation may be had recourse to without hesitation; but when there are no adhesions, or their existence is doubtful, he precautions to secure first adhesive inflammation, as advised by Bégin and Recamier. This consisted in dividing the peritoneum and dressing the wound with charpié, in order to produce firm adhesions.

It would appear that the first case of cholecystotomy, successfully performed in modern times, was by Dr. J. S. Bobbs,<sup>4</sup> of Indianapolis, reported under the title, "A Case of Lithotomy of the Gall Bladder." A woman, aged 30, tumor just inside of iliac bone, tender to pressure, diagnosis doubtful, probably ovarian. Operation June 16, 1867. Incision made between the umbilicus and pubis, omentum adherent, incision enlarged to an inch above the umbilicus on the right side, tumor five inches in length, two in diameter. Incision through the lower margin caused several small bodies, size of rifle bullets, to escape. Closed the incision of the sac by single stitch and cut the ends of the suture closely. Closed the wounds with suture and adhesive plaster. Examination of the calculi left no doubt as to their character; were of light specific gravity, and numbered between forty and fifty. The fluid was perfectly free from coloring matter. Recovery very satisfactory with no return of local trouble at the time of report, ten months after operation.

Dr. J. Marion Sims operated in Paris, April 18, 1878.<sup>5</sup> Patient under observation by her physician since previous January. Aspirated what was supposed to be a cyst of the liver, thirty-two ounces of dark-colored fluid. She continued deeply

<sup>4</sup> Transactions of Indiana State Medical Society, 1868, p. 68.

<sup>5</sup> British Medical Journal, 1878, Vol. i, page 811.



jaundiced, clay-colored stools, scanty high-colored urine. Under antiseptic precautions, an incision was made three inches in length, upon the right side, parallel to the linea alba. Cyst wall exposed, aspirated by trocar twenty-four ounces of dark fluid. Withdrew the emptied gall-bladder quite external to wound. Enlarged the incision and removed sixty gall-stones varying in size. Stitched gall-bladder to lips of wound. Operation tedious and difficult, lasting one hour and sixteen minutes. Death occurred eight days after, and at autopsy sixteen more calculi were found remaining in the duct. Dr. Sims' report of the case is in careful detail, and to the operation he gave the name since adopted, cholecystotomy (χολή—bile, κύστις—bladder, τομή—incision).

To Mr. Lawson Tait, of Birmingham, however, is justly accorded the high honor of having established, upon a sure basis, operative interference upon the gall bladder. Up to date, Feb. 18, 1888,<sup>6</sup> he reports forty-one cases of cholecystotomy, with only two deaths, these occurring on account of malignant disease. Mr. Tait follows closely the principles first laid down by Dr. Sims. He says, "The conclusions drawn from the surgical experience of these cases, is that the entire possibilities of the treatment of gall-stone and distended gall-bladder are exhausted in Dr. Sims' original paper, and that no further extension of it seems possible."

Recently Dr. Senger reported in the *Berliner Klinischer Wochenschrift* what he calls a new operation. The gall bladder is drawn as far as possible up from the wound, and sutured to its margin. After a day or two, adhesions will have

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<sup>6</sup> British Medical Journal, Feb. 18, 1888.

formed and it is then opened and emptied, but immediately closed. When the wound in the bladder shall have healed, the surrounding adhesions are divided and the organ returned within the abdominal cavity. The object of these measures is of course to restore their parts to their previous normal condition, deemed by him unsafe to attempt at a single operation. Langenbeck criticises the operation as untrustworthy by reason of adhesions being too recent and offering little advantage over that of biliary fistula which can usually be readily closed if it seems desirable.

Every physician of experience has met with cases of biliary obstruction from varying causes with fatal results. These conditions are much more common than might at first appear. Many interesting clinical histories are reported in the journals, too frequently followed with verification of diagnosis by post-mortem examination. In all the pathological collections, more or less interesting specimens are found in considerable number. In Dr. Jackson's catalogue of the Warren Anatomical Museum, in Boston, published in 1870, no less than sixty specimens, from as many different patients, are preserved, showing diseases of the gall-bladder and ducts; the larger number, of biliary calculi.

It was earlier believed that simple extravasation of bile into the peritoneum was fatal. Our present knowledge would teach that the bile *per se* may be absorbed by the peritoneum without causing much trouble, although wounds of the gall bladder are generally fatal because of attendant septic infection.

The most important question that arises in the discussion of the subject is, If cholecystotomy is a justifiable operation, when should it be performed?

*Injuries.*—Without doubt, in every case of wound or perforation of the gall-bladder, operative measures should be instituted without delay, since without surgical interference, there is little prospect of recovery.

*Empyema.*—Where empyema of the gall-bladder exists, there can be no doubt but that recourse should be had to operation, as early as the condition of the patient may seem to warrant. The temptation to aspirate should be resisted, since it is in itself dangerous and cannot afford permanent relief.

*Cystic Dilatation.*—When the gall bladder has become cystic, in all cases, surgical interference is indicated. Aspiration may aid in diagnosis as to the character of the fluid, and possibly the detection of the calculus, but at the most, it is only palliative.

*Biliary Obstruction.*—Although patients do live an indefinite number of years with gall-stones, frequently dying of other diseases, the recurrent attacks of colic are exhaustive and often fatal in their complications; jaundice induces dangerous cholemia; suppuration may be incident upon the changes which supervene from the presence of foreign bodies in the gall-bladder. Long continued obstructive jaundice and the changes which have occurred in the tissues, is doubtless an unfavorable complication, since thereby the patient's vital power is greatly depreciated. In complete obstruction of the common duct, cholecystotomy may prevent death from cholemia by permitting the escape of the biliary fluids externally. It is clearly established that the nutrition of the tissues may be maintained without the mingling of the biliary secretion with the contents of the intestinal canal.

A very considerable class of cases where ob-



struction exists in the common duct, merit our serious consideration, as to the means to be established for its relief. The earlier measures which we have reviewed, where only a fistulous tract was sought to be formed externally, fail in many cases of the desired result. The theoretic perfection of the operation consists in the restoration of the parts, as far as possible, to their former normal conditions. For every reason a permanent fistula has very serious objections.

When the cystic duct alone is obstructed, and no bile enters the gall-bladder, an abundant quantity of clear albuminous fluid is secreted from the mucous surface more or less changed, and this is illustrated in my case number three, where the organ contained no foreign body. If the hepatic and common ducts are unobstructed, there will remain a free flow of bile into the intestine without jaundice and the consequent changes which ensue from the liver. Where these conditions exist, with considerable cystic dilatation, there remains to the surgeon a choice of operative measures, either of opening the bladder with drainage, or of removing it altogether—cholecystectomy, as recommended and performed by Langenbeck. Dr. Smith<sup>7</sup> reports nine published cases of cholecystectomy where "one death only can be attributed to the operation."

Only recently Dr. Meredith<sup>8</sup> states that "this operation has lately been performed with success in several instances, notably by Mr. Thornton, with excellent results. After thoroughly cleansing the interior of the injured gall-bladder, the peritoneum covering its neck is cleanly incised, and the cystic duct is then freed from its connections sufficiently to allow of its being ligatured

<sup>7</sup> Greig Smith, "Abdominal Surgery," p. 552.

<sup>8</sup> Lancet, April 19, 1890, "Present Position of Abdominal Surgery."

and divided. Any bleeding vessels are then tied, and the edges of the divided peritoneum are accurately united by suture over the ligatured duct, a glass drainage tube being finally inserted before closing the abdomen."

Cholecystectomy can be favorably considered only in a very limited number of cases, where the gall-bladder has undergone marked pathological changes and its duct is so altered that the functions of this viscus are not likely to be restored. When these conditions pertain, there can be little doubt but that it better be removed, in the same manner as a cystic growth in any other part of the abdomen, yet in many cases the ease of operation and resultant safety will cause suturing to the abdominal wall, with drainage, to be preferred. When excised, the entire secreting membrane of the cyst should be carefully removed from the base, and the divided edges inverted by a continuous sero serous suture. The operation is completed by closure of the abdominal wound, usually better without drainage.

*Obstruction of the Common Duct.*—In a great majority of operative cases there is obstruction of the common duct, and when this occurs from a biliary calculus, methods of procedure, to be effective, must be such as to clear the passage, in order to allow a free escape of the biliary secretion into the intestinal canal.

A calculus in the gall-bladder alone rarely causes obstruction in the common duct. On this account the surgeon should not content himself in a completion of the operation without ascertaining, as far as possible, the patency of the canal into the intestine. This cannot always be easily determined. When a calculus is found in the common duct, it may often be dislodged by

gentle manipulation and removed from the gall-bladder.

When it is impossible to do this, the efforts of the surgeon should be directed towards the possibility of safely crushing it *in situ* with well padded forceps after the method of Richter, revived by Mr. Tait. It must remain a matter of individual judgment, as to how much force may be applied safely in the crushing, as well as to its method of application. If it shall prove impossible to remove the fragments by irrigation, they should be made sufficiently fine to allow their easy escape through the undilated portion of the duct into the intestinal canal. If, on account of the hardness of the calculus, or the condition of the surrounding parts, it shall be deemed unwise to attempt crushing, the further division of the duct, in order to obtain access to the stone, is advised, as illustrated in Case 5 in my series above reported.

Mr. Meredith<sup>9</sup> recommends the following: "In dealing, however, with a small and friable sac which has been unavoidably much injured during the extraction of the calculi, the above procedure may prove exceedingly difficult, if not impossible. Under such circumstances, one of two courses may be followed, provided always the patency of the duct has been ensured. The first of these alternative measures consists in carefully suturing the opening in the gall bladder and returning it into the abdominal cavity. This plan was first carried out, I believe, by myself in 1883, but my patient unfortunately died. The procedure has latterly, however, been successfully effected by other operators, and its adoption, in suitable instances, is fully justified, provided that means for drainage of the

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<sup>9</sup> Lancet, April 19, 1890.

peritoneal cavity in the immediate neighborhood of the sutured gall-bladder be taken."

When this has been accomplished, we are enabled to assure ourselves of the remaining portion of the duct. Other calculi may be present, or inflammatory changes may have supervened which render it still impermeable. When we have ascertained that no further obstruction remains, we are then under the necessity of making at least a partial closure of the canal, since it is impossible to attach the widely divided lips of the duct and bladder to the abdominal wall. In this instance, we may close the wound in part and use drainage, as is more commonly recommended, or complete the operation as I did in Case 5. This latter method of complete closure of the gall-bladder was first suggested by Sir Spencer Wells, and so far as I have ascertained it has been attempted in only three instances, one of which, as reported by Mr. Tait, was followed by a fatal result, because of escape of bile into the peritoneum.

To close so long a wound effectively would seem improbable by any method of interrupted suturing. The use of silk, as the material for suturing, no matter how prepared, would be likely to result disastrously, since it produces much irritation in the wound, which would be especially true if applied in repeated layers. The coaptation of the parts, as effected in Case 5, is simple, rapid, and makes a wound at once fluid proof; a method which I have adopted for years, in all cases of intestinal suturing. When the edges of the duct and gall bladder have been thus coapted, the operation is finished by closure of the abdominal wound *without drainage*.

So far as I have been able to ascertain, however, the attempt at incision of the duct to remove



a calculus has not been made, except in Case 5, of my series. Dr. Meredith suggests excision in his recent paper.<sup>10</sup> "Failing of success by any of these methods, (of removing a calculus within the duct) its removal by excision, followed by careful and accurate suture of the duct might possibly be performed with success."

One of the serious, and I am constrained to believe not seldom, dangers, resulting from biliary calculi, while yet retained in the gall-bladder, results from reflexive irritation as evinced by nausea and vomiting. It is now some years since the first case of this type came under my observation, the sufferer being a physician of exceptional wisdom. His diagnosis was perfectly correct, which he desired me to ascertain in the event of his death. The calculus which I here present was free in the gall-bladder, without obstruction of the biliary, or common duct. The immediate cause of death was from hæmorrhage into the stomach, produced by continuous retching.

Some years later, a similar case came under my observation, where the diagnosis was equally clearly determined, and demonstrated by an autopsy, and where operative measures were not favorably considered by the patient and family, as well as by the consulting physician.

In cases where the common duct is permanently occluded from inflammatory or other changes, the cystic duct remaining open and the gall-bladder not especially disorganized or adherent, it remains for consideration, if a permanent fistulous opening may not be effected between it and the duodenum. In a considerable number of cases on record nature has pointed out the possibility of this method by allowing to escape, through such a fistulous tract, calculi from the gall-bladder in-

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<sup>10</sup> *Lancet*, April 19, 1890.

to the intestine. In a most interesting case under my observation a few years since, I urged the opening of a distended gall-bladder, since the patient was dying of extreme cholemia. The post-mortem examination showed a non-malignant, inflammatory, complete closure of the common duct.

Winiwater successfully established a communication between the gall-bladder and the transverse colon. However, in this situation, the physiological effects of the biliary secretion are lost. Dr. Gaston,<sup>11</sup> of Atlanta, Ga., reports a series of experiments upon dogs where he established a permanent communication between the duodenum and the gall bladder. Winiwater advocates a modification of his operation, by selecting some portion of the small intestine which can be brought most conveniently into apposition with the gall-bladder, since the duodenum is not sufficiently movable to be adjusted.

These are sutured by the peritoneal surfaces only, and after five or six days adhesions should have been formed sufficiently strong to admit of a permanent opening being made. Although such an operation, as far as I know, has not been attempted upon the human subject, conditions may arise in which it should be taken into serious consideration.

The technique of the operation in cholecystotomy is comparatively simple. Incision may be in varying direction. Mr. Tait advocates the division parallel to the median line, just external to the rectus muscle. In my own cases, the parietal incision has been made parallel to the ribs. After having opened the abdominal cavity, the gall-bladder is examined by the finger. If the tumor is very large, its contents may at once be

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<sup>11</sup>Atlanta Med. and Surg. Journal, September and October, 1882.

evacuated with an ordinary trocar. Oftentimes the walls of the greatly distended gall bladder are very thin. In such instances it may be wise to make use of a small aspirating needle, instead of the trocar. The puncture should be made in the most dependant portion of the tumor. The abdominal cavity must be carefully protected by aseptic sponges to prevent the escape of any of the fluid into it. It may be a wise precaution, which I adopted in Cases 3 and 5, to unite the edges of the peritoneum to the gall-bladder carefully, by a running suture, prior to opening it. If the tumor is not very large, and the emptying of its contents with drainage is all that is required, suturing in this manner before opening is to be generally advised. It is easier effected with the gall-bladder tense, and gives more accurate coaptation than can be secured by uniting the gall-bladder when flaccid and empty.

The incision is now made into the gall-bladder sufficiently large to admit the finger and an examination of the contents is carefully made. Calculi may be removed by forceps, or scoop, care being exercised not to injure the delicate structures. If a stone is impacted in the neck of the gall-bladder, or the cystic duct, its removal will be attended with exceptional difficulty. The right fore-finger within the abdominal cavity may aid in its dislodgment, assisted by gentle procedure of operative measures, from within the duct. This failing, crushing by forceps carefully padded, or protected by rubber may be attempted. After crushing, the fragments should be removed through the wound if possible. If crushing proves impracticable, division of the parts, until the stone is reached, should be made, followed by closure, as already described.

If, as may be found expedient in a great ma-

jority of cases, a fistulous opening is determined upon, a soft rubber drainage-tube should be inserted, and the wound dressed with absorbent material. I have used with advantage a soft-rubber double drainage-tube, inserted into a diaphragm about the size of a half dollar. These have been especially made for me in one piece.

If the common duct is patent, the fistula will voluntarily close in a few weeks. It has been used, as an argument in favor of suturing and drainage, that adhesions are formed which would render easy the division, in the line of the old cicatrix, in case of subsequent obstruction, a contingency worthy of consideration.

Cholecystotomy may be accepted as an operation already established, worthy of adoption by the surgical profession. Present experience abundantly warrants this conclusion. More brilliant triumphs await its future development, when operative interference will be advised much earlier than at present. The more serious complications which render the operation especially difficult arise from previous inflammatory attacks with their resultant pathological changes.

In the *American Journal of the Medical Sciences*, for October, 1884, Drs. Musser and Keen tabulate all the hitherto recorded cases of cholecystotomy. They number thirty-five, by sixteen different operators, with ten deaths. Three fatal cases from hæmorrhage, one from peritonitis, the remaining cases death probably due to the previous condition of the patient. Since 1884, the histories of about one hundred cases of cholecystotomy, have been published by more than one-third as many different operators. It is safe to predict that the future history of operative measures, for the relief of biliary obstruction, will furnish one of the most brilliant chapters in surgery.



One of the most serious of all the abdominal diseases, as evinced by acute pain, prolonged suffering, and great mortality, confessedly without remedy from medicine, cholecystotomy offers help to the hopeless with an attendant danger in the hands of the experienced surgeon, of as small a percentage as in ovariectomy. By present demonstration, the closure of intestinal wounds by suture, or even resection, is to be preferred over an artificial anus. If operations upon the gall-bladder are undertaken, at a time when the organ itself is not materially changed, remaining free from adhesions to the surrounding parts, it would seem a safe conclusion that an opening, made into this viscus, should be closed with as great safety and as good reason as in that of the intestinal canal. If attempted, it should be completed with as much care and exactitude as in the latter instance.

It has been clearly shown that an *aseptic animal suture* is not only far safer when properly applied than silk, but that it also possesses the great advantage of causing an abundant proliferation of connective tissue along the tract of the buried suture. It may also be safely applied in repeated layers in order to coapt broad surfaces, in a manner unsafe to attempt with silk. After a considerable period it disappears to be replaced by vitalized tissue. Such a suture, itself *aseptic*, *aseptically* applied, in an *aseptic wound*, furnishes an important aid in dealing safely with wounds of the gall-bladder. There can be no doubt but that its proper use adds another factor of the highest importance in aseptic surgery, adding much to the safety and subsequent resulting good.

We cannot but believe that the animal suture, especially that from the tendon, properly preserved

and prepared, furnishes the surgeon with an aid of the highest importance. By means of its use, the tissues in nearly all the varieties of operative wounds, can at once be coapted and retained in position without further disturbance.





